Zipping

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Introduction

It's a process of **reducing the size** of one or more files or data streams by **encoding** them in a more efficient way. The goal of zipping:

- Reducer the amount of storage space needed
- Speed up data transmission over networks

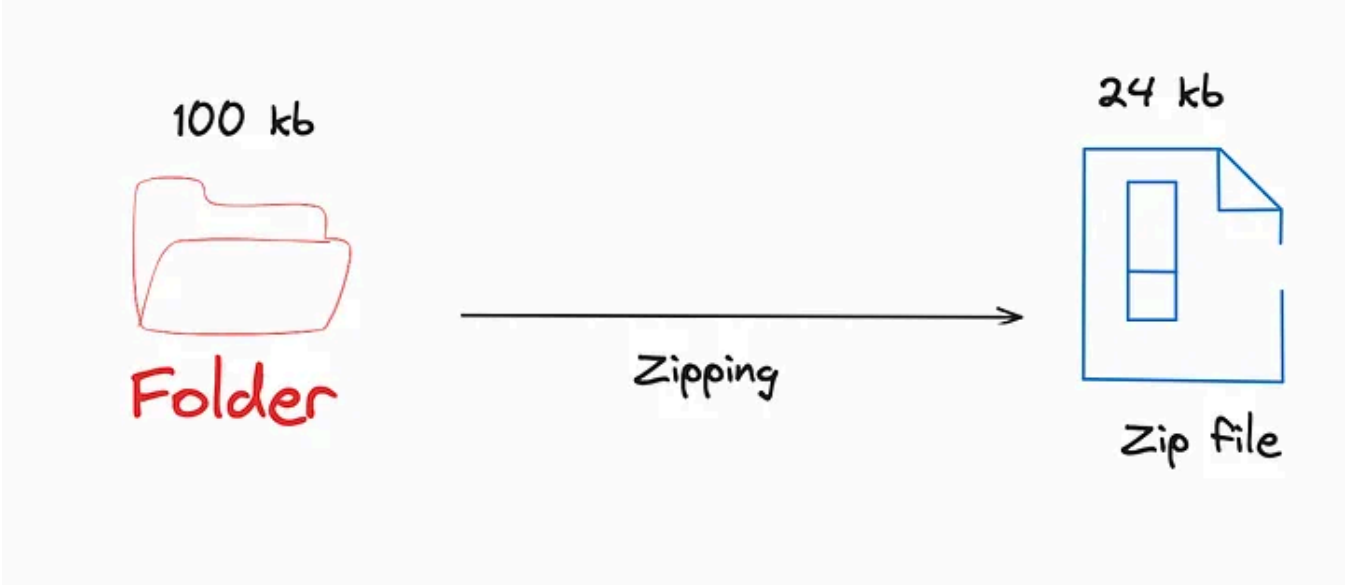

Fig 1.0: Zipping process

Algorithms

There are various compression algorithms and formats available. Algorithms **identifies patterns and redundancies in the data** and replaces them with more compact representations.

Common compression algorithms include Deflate (used in ZIP), gzip, zlib, and others.

Most simplest approach is: **Dictionary-based Compression**— Some compression algorithms, like Lempel-Ziv-Welch (LZW) used in GIF and zlib, use a dictionary-based approach. They build a dictionary of frequently occurring patterns and replace those patterns with **shorter codes**.

Zipping typically uses lossless compression, which means that the original data can be perfectly reconstructed from the compressed data. No information is lost during the compression and decompression process.

In some compression algorithms like **Deflate**, a **Huffman coding** step is used to assign shorter codes to more frequent patterns or characters in the data. This further reduces the size of the compressed data.

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